Paper No. 31

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte MARK S. RAMSEY
and WILLIAM C. MORRIS, Jr.

Appeal No. 97-4183
Application 08/424,128[1]

ON BRIEF

Before MEISTER, ABRAMS and McQUADE, Administrative Patent Judges.

MEISTER, Administrative Patent Judge.

DECISION ON APPEAL

Mark S. Ramsey and William C. Morris Jr. (the appellants) appeal from the final rejection of claims 9-14. Claims 16 and 17, the only other claims remaining in the application, stand

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[1] Application for patent filed April 19, 1995. According to appellants, the application is a continuation of Application 08/087,667, filed July 6, 1993, now abandoned.

allowed.

We AFFIRM.

The appellants' invention pertains to a method of adjusting the flow of drilling fluid through the nozzles in a drill bit while the drilling operation is taking place. Independent claim 9 is further illustrative of the appealed subject matter and reads as follows:

> 9. A method for adjusting the total flow area of a drill bit concurrently with drilling with a drilling fluid having a selected composition, comprising the steps of:
>
> (a) attaching a drill bit to a drill string, the drill bit including a plurality of nozzles, at least one of the nozzles being open and at least one of the nozzles having a closure means thereon to prevent upward or downward flow through the nozzle, the closure means being adapted to open at a pre-selected differential pressure;
>
> (b) placing the drill string and bit down a wellbore and commencing drilling; and
>
> (c) before the open nozzle has eroded or plugged and while drilling with the fluid of the selected composition, increasing the differential pressure across the bit so as to cause the closure means to open, causing an adjustment in the total flow area of the drill bit concurrent while drilling and without removing the bit from the wellbore.

The references relied on by the examiner are:

Kistler	3,261,413	Jul. 19, 1966
Miller et al. (Miller)	3,645,346	Feb. 29, 1972
Russian publication[2]	SU 861537	Sep. 7, 1981

Claims 9-14 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Miller or the Russian publication in view of Kistler.

The examiner's rejections are explained on pages 4 and 5 of the answer. The arguments of the appellants and examiner in support of their respective positions may be found on pages 3-6 of the brief and pages 6-8 of the answer.

OPINION

We have carefully reviewed the appellants' invention as described in the specification, the appealed claims, the prior art applied by the examiner and the respective positions advanced by the appellants in the brief and by the examiner in the answer. As a consequence of this review, we will sustain the rejection of claims 9-14 under 35 U.S.C. § 103(a) as being

[2] Translation attached.

unpatentable over Miller in view of Kistler. We will not, however, sustain the rejection of claims 9-14 under 35 U.S.C. § 103(a) as being unpatentable over the Russian publication in view of Kistler.

Considering first the rejection of claims 9-14 under 35 U.S.C. § 103(a) as being unpatentable over Miller in view of Kistler, it is the examiner's position that:

> Miller et al '346 disclose that the initially closed nozzle is opened by fluid pressure when the initially open nozzle becomes eroded (column 4, lines 15-39). However, Miller et al '346 also disclose in column 4, lines 4-8 that the dimensions and pattern of the initially closed nozzle system can be different from those of the initially open nozzles to permit the bit to adapt to different drilling conditions by merely closing one nozzle system and opening the other.
>
> * * *
>
> Kistler, Jr. '413 discloses that it is desired to use different nozzle dimensions for different drilling conditions during the course of drilling a borehole, such as type and depth of formation, rotary speed, weight on bit mud weight, etc. (see column

1, lines 26-36).

> It would have been obvious to one of ordinary skill in the art at the time the invention was made to open the initially closed nozzle(s) in the drill bit of Miller et al ’346 . . . for reasons other than erosion, plugging or lost circulation control in view of the teaching of Kistler, Jr. ’413. [Answer, pages 4 and 5.]

The appellants, on the other hand, argue that:

> Miller et al ’346 teaches a bit having two nozzle systems, and when the first nozzles become eroded from flow they are closed and a second set of nozzles is opened while the bit is at the bottom of a well. The invention is related to the problem of nozzle erosion. . . . Kistler ’413 discloses a shear relief valve to be placed in a bit and expelled if the bit flow passages become plugged and ?... is controllably expellable in other circumstances? (Kistler ’413 at col. 1, lines 56, 57). Kistler ’413 in the Background section of the patent, also discusses various conditions under which replaceable nozzles in a bit would desirably be changed. It is perfectly clear that the teachings of Kistler ’413 apply to changing the nozzles on the surface of the earth, while drilling has been interrupted. [Brief, pages 3 and 4.]

We are unpersuaded by the appellants’ arguments.

Initially we note that all of the disclosures in a reference must be evaluated for what they fairly teach one having ordinary skill in the art (***In re Boe***, 355 F.2d 961, 965, 148 USPQ 507, 510 (CCPA 1966)) and, in evaluating such a referenc-e, it is proper to take into account not only the specific teachings of the references but also the inferences which one skilled in the art would reasonably be expected to draw there-from (***In re Preda***, 401 F.2d 825, 826, 159 USPQ 342, 344 (CCPA 1968)). Moreover, the issue of obviousness is not only determined by what the references expressly state but also is determined by what they would fairly suggest to those of ordinary skill in the art. ***See, e.g., In re De Lisle***, 406 F.2d 1386, 1389, 160 USPQ 806, 808-09 (CCPA 1969) and ***In re Bozek***, 416 F.2d 1385, 1390, 163 USPQ 545, 549-50 (CCPA 1969).

Miller provides a bit having up to three nozzle systems (column 2, line 15). Other than the first nozzle system, the remaining nozzle systems are provided with at least one frangible member (43 or 86) that is rupturable at a predetermined upstream pressure. When the nozzles of one system become eroded, the flow of drilling fluid to the eroded

nozzles is cut off by plug 50 in the case of the embodiment of Figs. 1, 2 and 5 or by balls 91 in the case of the embodiment of Figs. 3, 4 and 6. As a result of the flow to the eroded nozzles being cut off, the upstream pressure increases to the point where the frangible members 43 or 86 rupture, thus providing for the flow of drilling fluid to one of the remaining nozzle systems. By such an arrangement, Miller provides for new nozzles to be utilized, when the nozzles previously being utilized become worn or eroded, without the need to withdraw the bit from the well (see generally, columns 1 and 2).

In addition to the above, as the examiner has noted, Miller ***also*** teaches that:

> Moreover, the nozzle dimensions and nozzle pattern of one system can be different from those of its paired system permitting the bit **10** to adapt to different drilling conditions by merely closing one nozzle system and opening another. [Column 4, lines 5-8.]

Accordingly, Miller teaches (or at least would fairly suggest

to) one of ordinary skill in the art that the separate nozzle systems can ***also*** be provided with nozzles of different dimensions or sizes, and that a change from one size nozzle to another may be effected ?by merely closing one nozzle system and opening the other? (i.e., in the same manner that eroded nozzles are taken out of service) in order to adapt to different drilling conditions, irrespective of whether the nozzles being taken out of service are eroded. Thus, the teachings of Miller are not limited to ***only*** taking eroded nozzles out of service as the appellants would have us believe but, instead, are ***also*** directed to changing from one size of nozzle to another when drilling conditions dictate.

With respect to claim 11, the artisan would also reasonably infer that the change in the dimension or size of the nozzles to ?adapt to different drilling conditions? is done for the purpose of increasing drilling efficiency. In addition, the artisan as a matter of ?common sense? (***see In re Bozek, supra***) would not change the ***size*** of the nozzles in accordance with Miller's teachings without first ?predicting the effect? of such a change.

While the examiner has also relied on Kistler (column 1, lines 29-36) for a broad teaching of changing nozzle size in order to adapt to various ?drilling conditions,? Miller, as we have noted above, clearly teaches such an arrangement.

In view of the foregoing, we will sustain the rejection of claims 9-14 under 35 U.S.C. § 103(a) as being unpatentable over Miller in view of Kistler.

Turning to the rejection of claims 9-14 under 35 U.S.C. § 103(a) as being unpatentable over the Russian publication in view of Kistler, the examiner has taken the position that it would have been obvious to open the closed or inactive nozzle of the Russian publication for reasons other than erosion or plugging in view of the teachings of Kistler. We do not agree. The Russian publication only teaches taking one nozzle out of service when it becomes plugged and opening a replacement nozzle in response to a rise in pressure of the drilling fluid caused by the plugged nozzle. There is no teaching or suggestion whatsoever in the Russian publication of changing the flow rate. Apparently recognizing this deficiency, the examiner has also relied on the teachings of

Kistler. While Kistler (column 1, lines 29-36) provides a broad teaching of changing nozzle size in order to adapt to various ?drilling conditions,? such a change is apparently effected when the drill bit is withdrawn from the well (as distinguished from the arrangement of the Russian publication wherein the change from one nozzle to the other is made while the bit is in the well). The examiner also makes much of the fact that Kistler states that the core 14 in nozzle 1 may be ?controllably? expelled from the nozzle. We must point out, however, that Kistler only apparently controllably expels this core for the purpose of expediting withdrawal of the bit from the well (see column 2, lines 36-42). Absent the appellants' own teachings, we can think of no cogent reason why one of ordinary skill in this art would have been motivated to combine the disparate teachings of the Russian publication and Kistler in the manner proposed. This being the case we will not sustain the rejection of claims 9-14 under 35 U.S.C. § 103(a) as being unpatentable over the Russian publication in view of Kistler.

In summary:

The rejection of claims 9-14 under 35 U.S.C. § 103(a) as

being unpatentable over Miller in view of Kistler is affirmed.

The rejection of claims 9-14 under 35 U.S.C. § 103(a) as being unpatentable over the Russian publication in view of Kistler is reversed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 CFR § 1.136(a).

AFFIRMED

JAMES M. MEISTER Administrative Patent Judge	)
NEAL E. ABRAMS Administrative Patent Judge	) BOARD OF PATENT) APPEALS AND) INTERFERENCES

JOHN P. McQUADE)
Administrative Patent Judge)

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